

Incentives in a Medicaid Carve-Out: Impact on Children with Special Health Care Needs

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Objective. To evaluate whether a specialty care payment “carve-out” from Medicaid managed care affects caseloads and expenditures for children with chronic conditions.

Data Source. Paid Medicaid claims in California with service dates between 1994 and 1997 that were authorized by the Title V Children with Special Health Needs program for children under age 21.

Study Design. A natural experiment design evaluated the impact of California’s Medicaid managed care expansion during the 1990s, which preserved fee-for-service payment for certain complex medical diagnoses. Outcomes in time series regression include Title V program participation and expenditures. Multiple comparison groups include children in managed care counties who were not mandated to enroll, and children in nonmanaged care counties.

Data Collection/Extraction Methods. Data on the study population were obtained from the state health department claims files and from administrative files on enrollment and managed care participation.

Principal Findings. The carve-out policy increased the number of children receiving Title V-authorized services. Recipients and expenditures for some ambulatory services increased, although overall expenditures (driven by inpatient services) did not increase significantly. Cost intensity per Title V recipient generally declined.

Conclusions. The carve-out policy increased identification of children with special health care needs. The policy may have improved children’s access to prevailing standards of care by motivating health plans and providers to identify and refer children to an important national program.

Key Words. Medicaid, managed care, carve-out, payment policies, chronic illness

Most state Medicaid agencies are turning to capitated prepayment to contain costs, to improve access to care, and to increase efficiency in the provision of services. However, there are concerns that the financial incentives accompanying prepaid care could affect services to chronically ill beneficiaries. To reduce financial disincentives for providing adequate care, Medicaid agencies are implementing a variety of prepayment strategies specifically for children with chronic conditions (Medstat Group 1997). For example, some policies exclude certain individuals (e.g., those with HIV) or exempt disabled

beneficiaries from mandatory enrollment. These policies may affect children's access to care, but few impact studies have been carried out.

California began a significant Medicaid managed care expansion in the mid-1990s. This produced a policy debate on how to preserve specialty care access for children with complex medical diagnoses while also improving access to primary care to the general population. California's planned expansion did not include any special financing provisions for the Title V Children with Special Health Care Needs program. Children who are eligible for the Title V program in California are those with serious medical diagnoses such as congenital anomalies, cerebral palsy, cancer, or other conditions associated with catastrophic medical expenses. Since 1935, the national Title V program has assured medical access to many children through direct payment of services, financial support of systems of care for children (e.g., special diagnosis-based care centers), and development of standards of care.

Legislation was passed in 1994 in California to preserve specialty care access for children in Medicaid with Title V diagnoses by reducing the financial risk borne by the health plans. Most Title V-eligible children were still required to enroll in managed care for primary care services, but any services specifically required for a child's Title V condition were "carved out" of health plan contracts. Placing providers at financial risk for many medical services, with specific services excluded from their risk, creates an incentive to shift costs to the "carved out" funding stream. Theoretically, such a policy motivates the provider to refer children to the entity managing the carve-out services whenever eligibility is suspected. It also creates an incentive to identify services as related to a qualifying diagnosis. For example, providers might refer all children with heart murmurs to Title V rather than only those whose serious defects clearly would confer eligibility, or providers might debate who should pay for a pneumonia hospitalization for a child whose severe asthma confers Title V eligibility. Thus the Title V carve-out policy may affect both the number of children in Title V and the number of services identified as Title V-related.

The first aim of this study was to determine whether the financial incentives of a carve-out policy increase "case-finding" of children with Title V-eligible conditions. The second aim was to determine how carving-out

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specialty services from a mandated managed care expansion affects total Title V expenditures.

In the next section, I discuss the policy framework and background relating to children with special health needs and managed care and describe the evaluation opportunity that California's managed care expansion provides. The third section describes the methods, and the fourth section provides the results. The fifth section concludes and discusses the implications of the findings.

POLICY BACKGROUND

Theory and Rationale for Carve-Out Impact

While managed care expansions appear to improve or maintain access to primary care (Leibowitz, Buchanan, and Mann 1992), the impact on specialty access is less clear. Capitated payment to prepaid health plans without risk adjustment can result in either underprovision of services or avoidance of these patients. Health plan incentives to compete on patient risk may be reduced by contract exclusions of services or of particular populations—such as those whose diagnoses require intensive, expensive medical care (Andrews et al. 1997; Glied 1998). Typically these exclusions, often termed “carve-outs,” are managed separately from other medical care, and have distinct budgets, provider networks, and incentive arrangements (Frank, McGuire, and Newhouse 1995).

Can such arrangements affect access and cost? Many studies show that financial incentives can affect hospital and physician behavior (Christensen 1992; Escarce 1993; Ellis and McGuire 1988, 1996; Gruber, Adams, and Newhouse 1997; Ma and McGuire 1998), although interpretations differ in how this in turn affects health care access and quality. Studies of moral hazard effects in workers compensation suggest that growth in managed care market penetration can induce providers to classify care as related to noncapitated diagnoses, and thereby shift the reimbursement of that care into the fee-for-service funding stream (Baker 1997; Butler, Hartwig, and Gardner 1997).

Carve-out arrangements are also used in mental health care reimbursement (Frank et al. 1996). In these behavioral health carve-outs, improved management of these services is often sought. In some cases, organizations specializing in behavioral health or other medical care manage those services (Frank et al. 1996; Brisson et al. 1997). A few studies show that managed care arrangements that “carve out” mental health services from medical care

contracts affect the number of referrals to mental health, as well as the intensity of mental health services provided (Sturm 1999a; Huskamp 1999).

The intensive health needs of chronically ill children make them vulnerable to underprovision of health care, given strong incentives to control costs in managed care (Ellis and McGuire 1988; Cartland and Yudkowsky 1992). While several studies have evaluated carve-outs in commercial health plans (Ma and McGuire 1998; Huskamp 1999; Sturm 1999b; Hartley 2001; Busch 2002), and a few have focused on managed behavioral health care for a Medicaid population (Manning et al. 1999), California's expansion of Medicaid managed care in the 1990s provides the opportunity to learn how a different type of carve-out policy affects expenditures and identification of eligibles. Any effects for this particular population are of interest because Title V programs can provide supplemental care coordination and provide seamless specialty care coverage in the face of fluctuations in income eligibility for Medicaid, given that Title V financial eligibility thresholds are less restrictive than Medicaid.

California's Managed Care Expansion and Carve-Out Policy

In California, two means-tested, publicly funded health programs that have been important for children with complex medical diagnoses are Title V and Medicaid. Title V of the Social Security Act began providing federal funding to states in 1935 for medical services to children with chronic or disabling conditions. Since that time, physicians have been required by federal and state administrative code to refer potentially eligible children to the Title V program. California's Title V medical eligibility covers more conditions than other states but like all states is limited to high severity medical conditions. Beginning in 1965 when Medicaid was enacted, income-eligible children under 21 years could receive both Medicaid and Title V services. An interagency agreement ensures that Title V does not supplant Medicaid funds; Title V-eligible children have their specialty medical services paid by Medicaid (at regular Medicaid payment rates) but preauthorized by Title V agencies. In California, counties with population exceeding 200,000 operate county-based Title V programs but follow all state administrative requirements.

In 1993, California's Department of Health Services (State DHS) issued a strategic plan to expand Medicaid managed care in California's largest counties (herein termed "mandated managed care counties"). State DHS planned for full capitation of primary and specialty care with no special

provisions for children with Title V-eligible medical diagnoses. Concerns expressed by child health advocates and pediatric providers led to legislation late in 1994 that required State DHS to exclude care for Title V diagnoses from health plan contracts when counties implemented mandatory managed care. This carve-out law excluded from prepayment only those services directly related to a child's Title V-eligible diagnosis. All other preventive, primary care, and specialty services unrelated to the Title V-eligible diagnosis would be provided by the health plans under capitation by the state. California's Title V carve-out is unique because of its service exclusion rather than population exclusion and also because a public agency rather than a specialized health plan (as in behavioral health carve-outs) managed selected services as beneficiaries enrolled in prepaid health plans.

Managed care enrollment was phased in by county, creating an opportunity to evaluate carve-out impact by comparing pre- and postcarve-out caseload and costs. Most managed care counties implemented one of two managed care models that differ in the children mandated to enroll. The models differed because California used two separate waivers of federal Medicaid law. The County Organized Health System (COHS) model was permitted by a federal "1915" Medicaid waiver that restricted beneficiary choice to a single prepaid health plan in a county. In the COHS model, State DHS required virtually all Medicaid beneficiaries to enroll in the county-based health plan, including Supplemental Security Income (SSI) beneficiaries and children in foster care. State DHS developed a second model—the Two Plan model—under a subsequent and less sweeping 1915 waiver. In the Two Plan model counties, the mandate was limited to cash assistance and nondisabled poverty linked Medicaid beneficiaries (who comprised about three-quarters of children in Medicaid) enrolled either in a quasi-public health plan ("Local Initiative") or a commercial health plan.

Partly as a result of contracting delays and the time necessary to establish large provider networks, counties implemented the managed care mandate at different times. Within most Two Plan counties, the competing health plans also began operating on different dates due to these contracting issues. Because State DHS did not mandate participation until both health plans were operational, the postcarve-out period in Two Plan counties includes (1) a partial implementation phase when participation was voluntary, and (2) a full implementation phase when the managed care mandate (and carve-out) was fully enforced.

This study uses the natural experiment created by phased-in county managed care expansion to determine whether a carve-out policy increases

the total children identified with Title V diagnoses and increases service expenditures by the Title V program.

METHODS

This section describes how the staged implementation of mandated Medicaid managed care in California produced a quasi-experimental design. It then describes the empirical approach and statistical methods. Data sources and variable definitions are then discussed.

Most of the 14 mandated counties studied here implemented managed care (and the Title V carve-out along with it) between January 1996 and early 1997. The different start-up dates created a natural experiment. This panel study compared Title V program outcomes between managed care and non-managed care periods, and between mandated and nonmandated children, for a 4-year period (January 1994 through December 1997). Another 8 managed care counties were not included in the study due to grandfathered CCS inclusion contracts (5 counties) or unique managed care systems with fewer mandated Medicaid eligibility categories (3 counties).

Comparison Groups

Table 1 shows the pre- and postcarve-out arrangements in California that provided the main comparisons in this study. Postcarve-out changes for the mandated children are of greatest interest. However, any impact on non-mandated children in managed care counties is also of interest because carve-outs may cause behavior change across a system rather than only for children directly affected by the new financial incentives. Multiple comparison groups were used to allow these hypotheses to be tested. One comparison was between mandated and nonmandated children in the managed care counties (Group 1 and Group 2, respectively). In managed care counties, the mandated group includes children who qualify for Medicaid through welfare-linked or other nondisabled income-related categorical eligibility. Two Plan counties also had a nonmandated group composed predominantly of children who are receiving disability-based cash assistance (e.g., SSI) or are in foster care. Most nonmandated children could voluntarily enroll but very few did. As noted earlier, in COHS counties virtually all children were mandated (Group 1) with 100% participation following the mandate. Thus there is no within-county comparison of mandated and nonmandated children in COHS counties.

Table 1: Participation Requirements in Medicaid Managed Care Prior to and Following Carve-Out Implementation

		<i>Postcarve-out</i>	
	<i>Precarve-out</i>	<i>Partial Implementation</i>	<i>Full Implementation</i>
<i>Managed care counties</i>			
Group 1 Mandated children	FFS	FFS or managed care	Managed care
Group 2 Nonmandated children	FFS	FFS or managed care	FFS or managed care
<i>Nonmanaged care counties</i>			
Group 3 Same beneficiary types as mandated children	FFS	FFS	FFS
Group 4 Same beneficiary types as nonmandated children	FFS	FFS	FFS

Notes: Partial and full implementation phases are defined for each county based on the county's initial managed care start date (when voluntary participation began) and the full implementation date (when the mandate became effective).
FFS = Fee-for-service.

Pre-post differences caused by secular statewide trends could be attributed to the carve-out if only the managed care counties are studied. Thus the other comparison in this study was Medicaid children in the nonmanaged care counties. Children in nonmanaged care counties who would have been affected by the carve-out had they resided in a managed care county (Group 3 in Table 1) can be compared with the mandated children in managed care counties (Group 1). The other children in the nonmanaged care counties (Group 4) provide a comparison with the nonmandated children in the managed care counties (Group 2).

To achieve the best possible representation of the counterfactual (what would have happened to caseload and expenditures in the managed care counties had the carve-out not been implemented), I identified Group 3 and Group 4 children from a subset of California's 36 nonmanaged care counties that had greatest possible equivalence to the managed care counties. Many of the 36 counties have very small Title V caseloads and greater monthly variability due to this smaller size. I determined that the eight nonmandated counties that operate independent Title V programs, as all mandated counties do, were comparable because they are closest to the mandated counties in population size and in Title V program characteristics. In a sensitivity analysis, I created a second comparison group by adding in three nonmandated counties that did not have independent Title V programs but did match the urban characteristics of the mandated managed care counties.¹ I used these two groups—"8 comparison counties" and "11 comparison counties"—to measure carve-out impact. Table 2 shows that even these two subgroups of

Table 2: Definition, Mean, and Standard Deviation (SD) of Model Variables

Variable	Definition	Mean (SD) ^b					
		Mandated Children			Nonmandated Children		
		Two Plan	8 Comparison Counties ^c	11 Comparison Counties ^c	Two Plan	8 Comparison Counties ^d	11 Comparison Counties ^d
Claimant number ^a							Mandated children
Total	Number of Medicaid children with paid Title V claims	316 (550)	38 (21)	32 (21)	585 (991)	86 (57)	70 (55)
expend ^a	Total Title V expenditures for Medicaid children	\$1,353,936 (2,087,415)	\$144,497 (123,171)	\$122,815 (113,260)	\$1,402,676 (2,365,354)	\$165,008 (121,192)	\$136,845 (114,639)
Total expended per recipient ^a	Total expended per Title V recipient	\$4,860 (1,455)	\$3,650 (2,118)	\$3,740 (2,215)	\$2,406 (578)	\$2,002 (993)	\$2,089 (1,129)
Medicaid enrollment ^a	Medicaid children within the group (mandated; nonmandated; managed care county; comparison county)	197,292 (299,336)	25,372 (14,941)	22,303 (13,869)	77,595 (122,363)	10,743 (5,557)	9,378 (5,315)
Fully capitated PHP enrollment	Percent enrolled in fully capitated prepaid health plans (PHPs) prior to managed care expansion and carve-out	6.1% (9.0)	0.4% (1.0)	0.8% (2.8)	1.3% (1.8)	0.1% (0.3)	0.2% (0.6)

^aNatural log of variable used in multivariate analyses.
^bMean monthly values for the 48-month study period.
^c“Mandated children” in the 8 comparison county and the 11 comparison county columns refers to children who would be mandated to managed care if they lived in a Two Plan managed care county. By definition, no mandate applies to these children because they are not in managed care counties.
^d“Nonmandated children” in the 8 comparison county and the 11 comparison county columns refers to children who would *not* be mandated to managed care even if they lived in a Two Plan managed care county.
COHS = County Organized Health System.

nonmandated counties are much smaller in size than the mandated counties. The magnitude of the difference is partly due to one large Two Plan county. For example, mean monthly Title V claimant volume over the study period among mandated children was 316 among the Two Plan counties but 153 for Two Plan counties excluding Los Angeles County (compared with means of 38 for the 8 county and 32 for the 12 county comparisons). Another program characteristic, expenditures per recipient, shows only modest differences between COHS, Two Plan, and the 8 and the 11 county comparisons.

The appropriateness of the nonmanaged care counties as comparisons for time trend was examined empirically to the extent permitted by available data. A multivariate analysis tested for a different precarve-out time trend in Title V caseload between the managed care counties and each of the county comparison groups (the 8 counties, and the 11 counties). In separate regressions combining managed care counties with each of the county comparison groups, interaction terms for year and comparison group showed no time trend difference between the precarve-out years of 1994 and 1995. Similarly no differences were found in another specification testing for a time trend using 6-month increments for 1994 through 1995, between managed care counties and either of the nonmanaged care comparison groups. The lack of time trend differences between managed care counties and each of the comparison groups suggested that these nonmanaged care counties provide a reasonable comparison.

Effect Specification

Carve-out impact was modeled by a postcarve-out term that was defined for each mandated managed care county based on the date that the carve-out became effective. One Two Plan county implemented the mandate after the study period and contributed the maximum of 48 control (precarve-out) months. In the Two Plan counties, carve-out impact was estimated using separate indicator variables for the partial and the full implementation phases. One dummy variable had value of "1" in partial carve-out months and "0" in all other months. The partial implementation period in Two Plan counties ranged from 1 to 16 months with a mean of 7 months and overall managed care participation rates of 22.8 percent (SD = 18.0) among mandated children and 2.5 percent (SD = 1.9) among nonmandated children. A second dummy variable had a value of "1" in full implementation months and "0" in all other months. Overall participation during full implementation was 69.2 percent (SD = 21.1) among mandated children and 5.9 percent (SD = 2.1) among

nonmandated children. Because COHS counties had no partial implementation phase and virtually no nonmandated children, the carve-out impact in COHS counties was estimated by a single pre-postcarve-out indicator, in a model with mandated children.²

For Two Plan counties, multivariate models were estimated separately for mandated and nonmandated children. In addition to those models, a difference-in-differences (DD) specification tested the hypothesis that the carve-out impact was greater among mandated than nonmandated children. An impact only on mandated children would suggest that providers modified their referral behavior only for children directly affected by the new financial incentives. An impact on both mandated and nonmandated children would suggest that the carve-out caused referral and authorization changes for all children. In the DD specification, observations for mandated and nonmandated children were included in the same model. Interaction terms of mandated status and partial implementation, and mandated status and full implementation, tested whether any postcarve-out increase was greater among mandated children.

Statistical Methods

Descriptive statistics were used to determine unadjusted changes in claimant number and expenditures. Multivariate regression was used to assess carve-out impact on program participation and expenditures. The coefficients for the partial and the full implementation indicator variables were used to determine the percent change in outcomes ($e^{\beta} - 1$).

Fixed county effects were used to help account for nonrandom assignment of managed care status to California's counties. A challenge in evaluating Medicaid policy changes is that targeted populations and locations are often purposefully selected. County implementation characteristics that were not experimentally assigned include the managed care model, timing of implementation, length of the partial implementation phase, and rates of managed care participation following the carve-out. Start-up dates and transition periods were affected by county-specific delays in establishing an adequate provider network and creating enrollment materials in a county's "threshold" languages. Socioeconomic factors, such as percent living below the federal poverty level (FPL), varied between counties (see online Appendix 1 at <http://www.blackwell-synergy.com>). Because some of these nonexperimental factors were difficult to operationalize and model, fixed county effects controlled for the plausible but unobservable differences across counties that are time invariant.³

The White correction (StataCorp 1997) was used so that the standard errors would be consistent in the presence of heteroskedasticity. In addition, because the same counties are observed in the time series over a period of 48 months, the claimant number and expenditure values may be correlated over time. This may cause standard errors to be understated and thereby affect inferences of significance for the coefficients. Thus in all regressions that pool counties, the assumption of independence within groups (the county cluster) is relaxed.

DATA SOURCES

The number of children with active Title V eligibility was identified through Title V-authorized Medicaid claims as there is no single statewide dataset on Title V participants. Paid fee-for-service Medicaid claims for services in the study period of 1994 through 1997 were obtained from the State DHS Medical Care Statistics Section (MCSS). For this study, MCSS abstracted all Title V-authorized claims for Medicaid beneficiaries aged 0–21 years with service dates between January 1, 1994 and December 31, 1997. This included 200,000 children and 2.25 million paid claims. MCSS also provided monthly counts of Medicaid enrollees and managed care participants by county and aid eligibility category.

Outcome Measures

The dependent variable in testing the hypothesis that referrals increased is the number of Title V claimants per month (Table 2). In the utilization analysis, the dependent variable was monthly expenditures on Title V-authorized Medicaid claims. Dependent variables of the number of Title V claimants using specific types of services (termed “recipients”) show how Title V case-mix changed, if at all. Total recipients of a particular service type were defined as all claimants in a month who had at least one paid claim for a given service type (physician office services, hospital outpatient, hospital inpatient, pharmacy). Total claimants and expenditures by provider type test the carve-out’s impact on less cost-intensive ambulatory services (e.g., physician services, pharmaceuticals) and on more cost-intensive inpatient services. Inpatient services dominate Title V expenditures; during the study period, inpatient services comprised approximately 83.4 percent of payments, with the remaining payments divided among the less cost-intensive services of pharmacy and medical supplies (5.6 percent), rehabilitation hospital services

(4.7 percent), inpatient physician services (2.3 percent), outpatient hospital services (2.1 percent), and ambulatory physician services (1.1 percent). Finally, dependent variables of expenditures per recipient for each of these different service types show any pre-postcarve-out change in case mix of children. A log transformation was performed on dependent variables. All outcomes were monthly observations specified at the county level.

Control Variables

Multivariate models included a variable of monthly child Medicaid enrollment to control for secular Medicaid enrollment changes over the study period. Second, the percentage of Medicaid children voluntarily enrolled in fully capitated prepaid health plans was used as a control variable to account for any children whose Title V services would not have been observed in precarve-out Medicaid paid claims. This control variable is necessary because in some counties, State DHS had permitted voluntary enrollment of Medicaid beneficiaries into fully capitated health plans prior to the managed care mandate and carve-out. Their capitation included Title V services, and the plans did not submit records of encounters for Title V conditions to State DHS. All children were disenrolled from these capitated health plans when the managed care expansion and carve-out took effect. Thus the control variable of percentage of Medicaid children in prepaid health plans is used to ensure that any increased Title V claimant activity that resulted from disenrollment from fully capitated health plans is not attributed to the carve-out policy. Third, dummy variables for year and season (quarter) were used. Year indicators accounted for any statewide trends in the Title V program (e.g., authorization practices, patterns of health care) or among the eligible population (e.g., rates of very low birth-weight) that were unrelated to the carve-out. Season indicators controlled for any epidemiological trends and seasonal trends in health care services.

FINDINGS

First, pre-postcarve-out differences in claimant volume are described for mandated children in the managed care counties, along with results of the DD model comparing mandated with nonmandated children in Two Plan counties. Multivariate findings for outcomes of total claimant volume and total expenditures are presented in Table 3. Findings for total recipients and total expenditures per service type are provided in Table 4, with findings for expenditures per recipient presented in Table 5.

Table 3: Carve-Out Impact on Title V Claimants and Expenditures

<i>Child's Mandated Status in Managed Care County^a</i>	<i>Two Plan Counties</i>				<i>COHS Counties</i>	
	<i>Mandated Children (Group 1 & Group 3)</i>		<i>Nonmandated Children (Group 2 & Group 4)</i>		<i>Mandated Children (Group 1 & Group 3)</i>	
	<i>Claimants (A)</i>	<i>Expenditures (B)</i>	<i>Claimants (C)</i>	<i>Expenditures (D)</i>	<i>Claimants (E)</i>	<i>Expenditures (F)</i>
Full implementation	0.300 (3.445)	0.190 (1.850)	0.064 (1.405)	0.025 (0.220)	0.290 (2.948)	0.248 (2.633)
Partial implementation	-0.015 (0.353)	0.130 (2.050)	-0.012 (0.311)	-0.030 (0.500)	—	—
Log Medicaid enrollees	1.623 (6.414)	0.827 (1.235)	1.308 (2.128)	0.721 (0.792)	1.399 (3.978)	0.488 (0.475)
Percent in fully capitated PHPs	0.001 (0.147)	0.000 (0.077)	0.031 (2.929)	0.017 (0.845)	-0.007 (1.390)	-0.005 (1.197)
1995	0.109 (2.400)	-0.063 (0.974)	0.107 (2.535)	-0.010 (0.174)	0.130 (2.798)	-0.007 (0.111)
1996	0.115 (2.900)	-0.205 (2.175)	0.141 (2.521)	0.096 (1.197)	0.215 (4.264)	-0.092 (1.322)
1997	0.285 (4.751)	-0.162 (1.452)	0.272 (4.781)	0.153 (1.494)	0.387 (8.015)	-0.011 (0.087)
Total counties	20	20	20	20	10	10
<i>N</i>	960	960	960	960	480	480
<i>R</i> ²	0.97	0.90	0.98	0.94	0.98	0.87

Notes: Carve-out effect is captured in the dummy variables for the full implementation and the partial implementation periods. Cells provide coefficients and absolute *t* statistics. Models include monthly observations for the managed care counties (Two Plan in Columns A–D, COHS in Columns E–F) and for the comparison children in the nonmanaged care counties. Dependent variables are log(claimant volume) and log(expenditures). The omitted year is 1994. Models include county and season fixed effects. The *t* statistics use White-corrected standard errors, with an assumption of independence within groups (county) relaxed.

^aMandated status (mandated; nonmandated) refers to whether or not the mandate applies to the child in a managed care county, and whether or not the mandate would apply to the child (in comparison counties) if the child lived in a managed care county.

PHPs = prepaid health plans; COHS = County Organized Health System.

Total Claimants

Pre–postcomparison of means showed that the number of Title V children in the mandated group increased following the carve-out for 9 of the 13 counties that implemented the carve-out (data not shown). In the nine Two Plan counties, increases in the average number of monthly claimants ranged from 12.6 percent to 99.9 percent. Multivariate analysis of managed care counties with no county comparison group showed a statistically significant 42 percent

Table 4: Changes in Total Recipients and Expenditures by Provider Type, for Mandated Children in Two Plan Counties

Category of Services Outcome	Physician Services (Office, Outpatient, ER, Home)			Physician Services (Inpatient)			Pharmaceuticals			Hospital Services (Inpatient)			Hospital Services (Outpatient)		
	Recipients (A)	Expend (B)		Recipients (A)	Expend (B)		Recipients (A)	Expend (B)		Recipients (A)	Expend (B)		Recipients (A)	Expend (B)	
Full implementation	0.433 (1.780)	-0.059 (0.157)	0.870 (3.653)	0.877 (2.156)	0.271 (1.781)	-0.206 (0.384)	0.115 (0.998)	0.050 (0.211)	0.937 (3.204)	0.683 (3.083)					
Partial implementation	-0.099 (0.750)	-0.332 (1.988)	0.275 (2.472)	0.298 (1.488)	0.153 (1.428)	-0.022 (0.068)	-0.007 (1.130)	0.087 (0.600)	0.067 (0.670)	0.004 (0.039)					
Log Medicaid enrollees	1.545 (1.576)	0.420 (0.181)	1.803 (2.204)	0.898 (0.624)	-0.322 (0.399)	-1.884 (0.618)	1.154 (1.852)	0.384 (0.269)	1.158 (1.291)	1.744 (1.876)					
Percent in fully capitated PHPs	0.020 (1.326)	0.018 (1.614)	0.024 (3.128)	0.028 (2.642)	-0.003 (0.469)	-0.030 (1.366)	-0.001 (0.230)	0.001 (0.153)	0.004 (0.280)	0.000 (0.024)					
1995	0.051 (0.924)	-0.356 (2.445)	-0.130 (1.857)	-0.400 (3.236)	0.235 (4.066)	0.515 (2.942)	-0.090 (1.648)	-0.216 (1.591)	0.040 (0.617)	-0.142 (1.321)					
1996	0.065 (0.728)	0.078 (0.441)	-0.216 (2.406)	-0.444 (2.721)	0.193 (2.517)	0.643 (2.982)	-0.153 (2.819)	-0.328 (2.125)	0.226 (3.242)	0.169 (1.472)					
1997	0.493 (2.623)	0.728 (3.321)	0.014 (0.100)	-0.110 (0.348)	0.236 (2.005)	0.989 (2.119)	-0.021 (0.281)	-0.201 (1.432)	0.484 (4.193)	0.478 (3.571)					
R ²	0.89	0.61	0.89	0.62	0.91	0.71	0.93	0.72	0.89	0.72					
N	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104	1,104					

Notes: Cells provided coefficients and absolute *t* statistics. Each model includes monthly observations for mandated children in Two Plan counties and the comparison children in 11 nonmanaged care counties. Each model includes county fixed effects and season fixed effects. The omitted year is 1994. The *t* statistics use White-corrected standard errors, with the assumption of independence within groups (county) relaxed.

(1) The dependent variable is log of monthly expenditures.

(2) The dependent variable is log of monthly expenditures per monthly recipients.
PHPs = prepaid health plans; ER = emergency room.

Table 5: Changes in Expenditures per Total Recipients by Provider Type, for Mandated Children in Two Plan Counties

<i>Category of Services</i>	<i>Physician Services (Office, Outpatient, ER, Home) (A)</i>	<i>Physician Services (Inpatient) (B)</i>	<i>Pharmaceuticals (C)</i>	<i>Hospital Services (Inpatient) (D)</i>	<i>Hospital Services (Outpatient) (E)</i>
Full implementation	-0.476 (1.867)	0.008 (0.037)	-0.476 (1.101)	-0.065 (0.462)	-0.254 (2.041)
Partial implementation	-0.227 (1.803)	0.023 (0.154)	-0.175 (0.716)	0.094 (0.953)	-0.062 (0.793)
Log Medicaid enrolled	-0.984 (0.660)	-0.873 (1.022)	-1.561 (0.654)	-0.771 (0.839)	0.586 (1.126)
Percent in fully capitated PHPs	-0.003 (0.322)	0.004 (0.555)	-0.027 (1.699)	0.002 (0.434)	-0.004 (0.846)
1995	-0.395 (3.125)	-0.270 (3.089)	0.280 (1.941)	-0.126 (1.277)	-0.181 (2.335)
1996	0.025 (0.170)	-0.222 (1.912)	0.450 (2.675)	-0.175 (1.635)	-0.058 (0.707)
1997	0.239 (1.557)	-0.121 (0.568)	0.662 (1.928)	-0.180 (2.299)	-0.006 (0.078)
R^2	0.23	0.27	0.45	0.15	0.24
N	1,104	1,104	1,104	1,104	1,104

Notes: Carve-out effect is captured in the dummy variables for the full implementation and the partial implementation periods. Cells provided coefficients and absolute t statistics. Each model includes monthly observations for the Two Plan counties and the 11 comparison counties. Each model includes county fixed effects and season fixed effects. The omitted year is 1994. The t statistics use White-corrected standard errors, with the assumption of independence within groups (county) relaxed.

PHPs = prepaid health plans; ER = emergency room.

increase in claimant number in Two Plan counties and an increase in the COHS counties. Claimants among nonmandated children also increased in the Two Plan counties but with a smaller magnitude of 10 percent. The DD model showed an increased number of Title V claimants among mandated children relative to the nonmandated children ($p < 0.04$, data not shown).

The following results are for multivariate analysis using nonmandated county comparison groups. Table 3 presents multivariate findings on monthly Title V caseloads separately for mandated and for nonmandated children. Effect estimates using the 8 nonmandated county comparison groups are presented in the discussion that follows, first for Two Plan counties and then for COHS counties, with selected results using the 11 comparison counties. Results for the 11 comparison counties are provided in Appendix 2 at <http://blackwell-synergy.com>.

For Two Plan counties, the carve-out was associated with a 35 percent increase in Title V claimants among mandated children using the 8 county comparison group (Table 3, Column A). Using 11 comparison counties, the estimate was smaller in magnitude (23 percent) and no longer statistically significant ($p = .09$). DD analysis showed increased claimants in mandated relative to nonmandated groups in the full implementation period of 21 percent ($p < .04$) using 8 county comparisons and a nonstatistically significant 18 percent ($p < .06$) using the 11 county comparisons. The claimant increase was statistically significant in the COHS counties using either the 8 county comparison group (34 percent) or the 11 county comparison group (27 percent).

Expenditures for Title V-Related Services

Table 3 shows no statistically significant increase in expenditures in the Two Plan counties despite the apparent claimant increase. The lack of statistical significance held for the modest increases in expenditures of 14 percent in the partial implementation phase ($p = .05$) and 21 percent in the full phase ($p = .08$) (Column B) with similar results using the 11 comparison counties. Expenditures did not increase for nonmandated children, as illustrated in Column D. The DD specification showed that the carve-out did not increase expenditures among mandated children relative to the nonmandated children ($p = .12$), using either county control group.

In contrast, there was a statistically significant increase in expenditures in COHS counties with estimates of 28 percent using 8 comparison counties (Column F) and 23 percent using 11 comparison counties. Comparison of outcomes for the subgroup of SSI children in Two Plan and COHS counties shows that claimant volume and expenditures in this subgroup increased when they were mandated to enroll but did not increase when they were not mandated (data not shown).

Total Expenditures by Type of Service

Table 4 presents the outcomes of recipients of one or more Title V services of a given type and total expenditures per service type. Table 5 presents per recipient expenditures for each service type. The following discussion presents only the findings for mandated children. Results were not sensitive to the comparison groups used, so the following discussion presents only the findings using the 11 comparison counties.

Table 4 shows that following the carve-out in Two Plan counties, the number of children using ambulatory physician services increased by 54

percent while hospital outpatient services increased by 155 percent. Despite the greater number of children receiving Title V-authorized ambulatory physician services, total expenditures in this category did not increase. Outpatient hospital expenditures increased by 98 percent. There was no impact on expenditures for pharmaceuticals. Neither the number of children receiving hospital inpatient services nor inpatient expenditures increased with the carve-out. The number of recipients as well as expenditures increased for physician inpatient services. COHS counties experienced a significant increase in all ambulatory service categories (physician, outpatient, and pharmaceuticals) as well as in inpatient services (data not shown).

The results in Table 5 show that the cost intensity of services per Title V recipient declined for physician and hospital outpatient services.

CONCLUSIONS

The number of children receiving services through Title V increased substantially after the carve-out in counties that transitioned all children to managed care. Effect estimates were similar in counties with a partial managed care mandate, but results were less conclusive in these counties because estimates did not reach statistical significance when a larger group of comparison counties was used to represent the counterfactual. Taken together, the results support the hypothesis of carve-out impact on case-finding and show that the impact on overall expenditures depends upon the scope of the managed care mandate.

The study also shows that the effect was concentrated in the full implementation phase. The partial implementation phase may represent the steepest part of the “learning curve” period where providers become accustomed to the new incentives. A learning curve pattern has been found in other studies of financing policy changes (Sturm 1999a, b; Busch 2002). In counties where nearly all Medicaid children enrolled in managed care as soon as the mandate became effective, both the number of children and overall expenditures increased. Health plans and providers may have learned to use the Title V funding stream more quickly and effectively when the transition to managed care was immediate and nearly universal among Medicaid children.

Modest increases in expenditures met statistical significance thresholds only in the COHS counties because the inpatient services that dominate Title V expenditures were not affected by the carve-out in the Two Plan counties. The partial managed care mandate in these Two Plan counties only increased the number of children with claims for ambulatory care (including physician

and hospital outpatient services) and ambulatory services comprise a small proportion of Title V-authorized expenditures. This suggests that carve-out impact depends on which Medicaid children are required to enroll in managed care. Disabled children receiving SSI were mandated to enroll only in COHS counties.

This analysis of caseload and expenditure changes suggests that the carve-out policy increased case-finding of Title V eligible children who would not have been referred or found eligible prior to the carve-out. Findings suggest that the carve-out stimulated health plans and providers to identify additional children with Title V conditions and did not only increase Title V authorization among children already known to the program. It appears that the carve-out impact was generally concentrated in children with less cost-intensive health care needs. However, the carve-out effect may be a combination of increased monthly claimant activity among children already known to Title V as well as new claimant activity among those who would not have been known to Title V in the absence of the carve-out.

LIMITATIONS AND FUTURE RESEARCH

A limitation to natural experiments is that the affected and unaffected groups often differ systematically on unmeasurable factors that are associated with the health system and provider networks. This study used multiple comparison groups to test the sensitivity of results given that no perfect comparison existed. Although point estimates were consistently in the same direction and generally similar in magnitude, results were not always statistically significant using both comparison groups. Given the limited study period, it is difficult to definitively establish the time trend in comparison counties as the appropriate counterfactual.

This study did not evaluate whether the providers, services received, and timeliness of care changed as a result of the carve-out. At a minimum, Title V involvement in the care of more children created the opportunity of applying Title V standards of care to a greater proportion of chronically ill children and thereby increased the likelihood that children would receive care from Title V certified providers and at earlier stages of their diagnosis. It is not possible to know how care might have changed had the carve-out policy been substituted for a completely capitated managed care system. Overall utilization of specialty care pre- and postcarve-out cannot be compared because encounter data within capitated managed care are not available.

Finally, the carve-out might also have had some negative impact. A full evaluation of cost implications of the carve-out would involve quantifying the resulting administrative costs to prepaid health plans, providers, and Title V. Some children may have experienced delays in care while the health plans and Title V debated a child's eligibility or their respective responsibilities for services. These questions cannot be answered using Medicaid claims data but are deserving of further research using caseload analysis and qualitative evaluation methods.

DISCUSSION AND POLICY IMPLICATIONS

Was the carve-out an appropriate policy? By definition, it achieved its purpose of minimizing the cost containment incentives of health plans by limiting their financial risk. This study shows that a financing policy designed to preserve access can actually improve children's access to prevailing standards of care by strengthening health plan and provider incentives to identify vulnerable populations in need of specialty care, and care coordination.

The oversight that Title V can offer is important because there are few validated process and outcome measures of health care access and quality for children with complex medical diagnoses. The more limited, structural quality measures that Title V can use include establishing the qualifying standards for providers, compensating only those providers who are qualified to provide the care, and identifying all eligible children as early as possible. Children receiving care outside of the Title V program must rely upon the specialty networks and referral and authorization standards set by prepaid health plans and are not under the supervision of a public program with expertise in professional standards for pediatric subspecialty care.

The carve-out also effectively encouraged health plans to identify children who have special health needs. This new incentive created an opportunity for health plans to target this population for quality of care studies and care coordination services although it is not known if all of the health plans are actually doing so.

While an unintended consequence, this carve-out policy was an effective mechanism for improving Title V case finding. Although states might not implement specific financing strategies solely for the purposes of case finding, these results show that financial incentives can affect the identification of children with special health needs.

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NOTES

1. The urban–rural continuum (U.S. Department of Agriculture 1998) rates counties on a scale of 0–9 based on several factors: degree of urbanization (presence of large urban center), being physically adjacent to a metropolitan county, and contribution to the metropolitan county's labor force. Criteria used to classify counties are based on a 1993 Office of Management and Budget (OMB) definition, and include having at least 2 percent of the employed labor force that commute to the metropolitan area.
2. One COHS county used a single mandated enrollment date. The second of the two COHS counties phased in the mandatory enrollment over a 6-month period based on the child's Medicaid eligibility category. Despite this difference, there was no voluntary enrollment period in either COHS county because a child's enrollment was immediate once the mandate was effective for their eligibility group.
3. Examples of the types of differences in county health care systems that would be captured by fixed county effects include the following: historical differences in Title V referral patterns across counties; differences in technology use; and county-specific medical care patterns that remain fixed over the study period.

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Appendix 1: Characteristics of Mandated Managed Care Counties

<i>Managed care model</i>	<i>County</i>	<i>Implementation characteristics</i>			<i>Low-income children & Medicaid</i>	
		<i>Plan type(s)**</i>	<i>Start date</i>	<i>Study month (1-48)</i>	<i>% children <FPL CY 1995</i>	<i>% population in Medicaid CY 1995</i>
Two Plan	Alameda	LI	1/96	25	17.3%	15.2%
		CP	7/96	31		
Two Plan	Kern	LI	7/96	31	27.8%	23.1%
		CP	9/96	33		
Two Plan	Contra Costa	LI	2/97	38	12.3%	10.8%
		CP	3/97	39		
Two Plan	Fresno	CP-1	1/97	37	36.3%	28.8%
		CP-2	11/96	35		
Two Plan	Los Angeles	LI	4/97	40	33.7%	19.7%
		CP	7/97	43		
Two Plan	Riverside	LI	9/96	33	19.7%	15.6%
		CP	3/98	----		
Two Plan	San Bernardino	LI	9/96	33	22.9%	20.1%
		CP	3/98	----		
Two Plan	San Francisco	LI	1/97	37	20.6%	15.9%
		CP	7/96	31		
Two Plan	San Joaquin	LI	2/96	26	27.2%	23.5%
		CP	2/97	38		
Two Plan	Santa Clara	LI	2/97	38	13.4%	12.0%
		CP	10/96	34		
Two Plan	Stanislaus	LI	10/97	46	24.6%	23.0%
		CP	2/97	38		
Two Plan	Tulare	CP-1	2/99	----	37.3%	30.0%
		CP-2	1/00	----		
COHS	Orange*	N/A	10/95	22	16.4%	11.2%
		N/A	2/96	26		
		N/A	4/96	28		
COHS	Santa Cruz	N/A	1/96	25	17.8%	12.0%

* Multiple effective dates are shown for Orange County because several Medicaid aid eligibility groups were phased into mandatory managed care, with 100% participation reached by April 1996.

** LI=Local Initiative, CP=Commercial plan (Fresno and Tulare each had two Commercial plans and no Local Initiative). N/A denotes not applicable.

---- Indicates start date for the second health plan in the "Two Plan model" county was after the study period. These three Two Plan counties did not fully implement the managed care carve-out during the study period.

Appendix 2: Carve-Out Impact on Title V Claimants and Expenditures Using 11 County Comparison

<i>Child's mandated status in managed care county* Comparison counties used in model</i>	<i>Two Plan counties</i>				<i>COHS counties</i>	
	<i>Mandated children (Group 1 & Group 3)</i>		<i>Non-mandated children (Group 2 & Group 4)</i>		<i>Mandated children (Group 1 & Group 3)</i>	
	<i>Claimants</i>	<i>Expenditures</i>	<i>Claimants</i>	<i>Expenditures</i>	<i>Claimants</i>	<i>Expenditures</i>
	(A)	(B)	(C)	(D)	(E)	(F)
Full implementation	0.209 (1.773)	0.062 (0.336)	0.028 (0.576)	-0.042 (0.381)	0.240 (2.771)	0.204 (1.822)
Partial implementation	-0.060 (0.997)	0.061 (0.579)	-0.032 (0.800)	-0.068 (1.266)	---	---
log Medicaid enrollees	1.086 (2.085)	0.500 (0.447)	1.465 (2.386)	0.666 (0.763)	0.508 (0.786)	0.763 (0.769)
Percent in fully capitated PHPs	-0.000 (0.075)	-0.002 (0.498)	0.022 (1.843)	0.014 (0.800)	-0.002 (0.777)	-0.006 (2.389)
1995	0.076 (1.716)	-0.118 (1.280)	0.108 (2.777)	0.050 (0.807)	0.134 (3.626)	0.007 (0.095)
1996	0.118 (2.944)	-0.191 (2.032)	0.143 (2.618)	0.145 (1.728)	0.253 (4.588)	-0.071 (0.887)
1997	0.305 (4.841)	-0.091 (0.812)	0.294 (5.078)	0.249 (2.228)	0.413 (7.638)	0.085 (0.735)
Total counties	23	23	23	23	13	13
N	1,104	1,104	1,104	1,104	624	624
R squared	0.97	0.88	0.99	0.92	0.98	0.84

Notes: Carve-out effect is captured in the dummy variables for the full implementation and the partial implementation periods. Cells provide coefficients and absolute t statistics. Models include monthly observations for the managed care counties (Two Plan in Columns A-D, COHS in Columns E-F) and for the comparison children in the 11 non-managed care counties. Dependent variables are log(claimant volume) and log(expenditures). The omitted year is 1994. Models include county fixed effects and season fixed effects. The t statistics use White-corrected standard errors, with assumption of independence within groups (county) relaxed.

* Mandated status (mandated; non-mandated) refers to whether or not the mandate applies to the child in a managed care county, and whether or not the mandate would apply to the child (in comparison counties) if the child lived in a managed care county.